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## FOREIGN TECHNOLOGY DIVISION



PROBLEMS OF FRICTION THEORY, WEAR AND LUBRICATION ACTION

by

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By: N. D. Donchenko

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ABSTRACT: This article describes the scientific council on friction and lubrication of the Academy of Sciences of USSR which carried out on June 30 through July 3 in Moscow an All Union Conference on friction theory, lubrication action, and new lubrication materials. The conference was held in 7 sections: friction theory, wear theory, new structural materials for friction units, calculation and construction problems of friction units, testing methods, instruments and modeling theory, study of lubrication action and new lubrication materials. Highlights of the conference are discussed. English Translation: 2 pages.

PROBLEMS OF FRICTION THEORY, WEAR AND LUBRICATION ACTION  
(All Union Conference in Moscow)

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The scientific council on friction and lubrication of the Academy of Sciences USSR carried out on June 30 through July 3 in Moscow an All Union Conference on the friction theory, lubrication action, and new lubrication materials. In this conference 600 specialists took part, and among them great scientists in the field of mechanics, physics, physical chemistry, and theory of high molecular compounds. The conference was held in seven sections: friction theory, wear theory, new structural materials for friction units; calculation and construction problems of friction units, testing methods, instruments and modeling theory, study of lubrication action new lubrication materials.

At the plenary meeting, by which the conference was opened, section chairmen made reviewing reports on the state of the given area of science in the USSR and abroad. In addition, with reports came up P. A. Rebinder- about absorption plastification of surface layer as the basis of boundary friction in surface layers and L. S. Palatnik- about the nature and properties of high strength vacuum condensated films.

At section meetings were evaluated 157 reports and 39 announcements. In the report by I. V. Kragel'skiy attention of conference participants was attracted by the

new concept of "outer friction threshold", as well as a calculated equation to determine maximum gripping loads.

Much attention at the conference was devoted to new problems, originating during the study of wear phenomena (thermal problems, modeling of the wear process, quantitative evaluation of wear etc.). Solving these problems appears to be a greater step toward the creation of engineering calculation methods for wear of friction units.

As mentioned by D. N. Reshetov, the theory of calculation and construction of friction units is presently to a greater degree based on physical characteristics of materials. Discussed were also practical applications in friction units of progressive liquid lubrs, for example, concentrated oils with polymeric and other admixtures.

A fruit bearing discussion was held on a series of theoretical and practical problems, especially about the nature of grasping solid bodies, the role of purifying lubrication oils in the process of exploitation, hydrodynamic frictions etc. An interest was made by the Ye. L. Kravchenko report on the grasping of aluminum and copper in ultra high vacuum ( $10^{-9}$  -  $10^{-11}$  tores), where for the realization of grasping is sufficient only a light contact of two metal surfaces.

As the conference has shown, in recent years considerably grew the role of theoretical examinations, allowing to solve a series of practical problems. The most valuable result appears to be the creation of new highly qualitative wear resistant friction, anti-friction and self-lubricating materials for friction units.

The conference recommended to turn special attention to the amplification of investigations, directed to raise the reliability and long service life of machine details, and development in the nearest future on the basis of available analytical rules engineering calculation methods for the calculation of wear of machine details.

The next conference is intended to be carried out in 1970.